CLOSING SLIDER AND OPENING/CLOSING SLIDER ~~FOR A PLASTIC BAG~~

Technical Field

[0001] The present invention relates to a closing slider and an opening/closing slider, and more particularly to a slider for closing a zipper provided at an open portion of a plastic bag and a slider for opening and closing the zipper.

Background of the Invention

[0002] Figs. 10a and 10b show a conventional plastic bag 1. This bag 1 is produced by fusing resin films at sides and by cutting the films along the fused sides, or by melting resin films at sides. The bag 1 has a zipper 8 at an open portion 2. The zipper 8 is composed of a groove 8a and a protrusion 8b, which are mutually engageable and disengageable, provided on mutually opposite inner surfaces of flaps 3 at the open portion 2. There are various kinds of structures and shapes for the groove 8a and the protrusion 8b of the zipper 8.

[0003] There are three ways of opening and closing the zipper 8 of the plastic bag 1 as follows: 1) opening the zipper 8 by pulling the flaps 3 by hand and closing the zipper by use of a slider; 2) opening the zipper 8 by sliding a slider in one direction and closing the zipper 8 by sliding the slider in the opposite direction; and 3) opening and closing the zipper 8 by hand.

[0004] Figs. 11a, 11b and 11c show an example of the closing slider used in the case of 1). The closing slider 10 has side legs 11

which are located outside the flaps 3, and a center leg 15 which is located between the flaps 3 and which has a length not reaching the zipper 8. When this slider 10 slides in one direction, mounts 12 formed on the inner walls of the side legs 11 push the groove 8a and the protrusion 8b of the zipper 8, respectively, and thereby, the groove 8a and the protrusion 8b come into engagement with each other. The center leg 15 serves as a stopper so that the slider 10 will not come off from the zipper 8 when the slider 10 reaches a side end 2a of the open portion 2. Also, the side legs 11 have bulges 13 bulging inward so that the slider 10 will not come off upward.

[0005] Although the closing slider 10 is structured to prevent the slider 10 itself from coming off from the open portion 2 of the bag 1, when a certain degree of force is applied to the slider 10, the slider may come off. Once the slider 10 comes off, it is very difficult to fit the slider 10 in the open portion 2 again. More specifically, in order to fit the slider 10 in the open portion 2 again, the center leg 15 must be inserted between the flaps 3. However, the flaps 3 are caught and pushed by the side legs 11, and it is substantially impossible to insert the center leg 15 between the flaps 3 without using a special jig.

[0006] At a start of closing the zipper 8 by use of the closing slider 10, in order to move the slider 10 from the side end 2a of the open portion 2 smoothly, the side end 2a shall be picked by hand. However, if the bag 1 is made by melting, the side end 2a does not have an enough margin to be picked by hand, and a smooth start of the closing motion of the slider 10 is difficult.

[0007] As the opening/closing slider used in the case of 2), a slider suggested by the present applicant (see Japanese Patent No. 2871671) is known, and Figs. 12a through 12d show the slider. The slider 20 has a couple of side legs 21 and a center leg 25. The center leg 25 has recesses 26, in which the groove 8a and the protrusion 8b of the zipper 8 are positioned, and bulges 27 and 28 respectively above and under the recesses 26. The center leg 26 also has a cut-off 29 by the side of the recesses 26. The side legs 21 have bulges 22 bulging toward the cut-off 29 of the center leg 26.

[0008] While the opening/closing slider 20 is sliding in a closing direction, the bulges 22 push the groove 8a and the protrusion 8b of the zipper 8 into the cut-off 29, and the groove 8a and the protrusion 8b come into engagement with each other. Thereby, the zipper 8 is closed. On the other hand, while the opening/closing slider 20 is sliding in an opening direction, the center leg 25 separates the groove 8a and the protrusion 8b from each other, and thereby, the zipper 8 is opened.

[0009] In order to start the opening motion and the closing motion of the slider 20 smoothly, the side end 2a of the open portion 2 shall be picked by hand. However, as described above, if the bag 1 is made by melting, the side end 2a does not have an enough margin to be picked by hand, and smooth starts of opening and closing the zipper 8 are difficult.

[0010] An object of the present invention is to provide a closing slider which can be reattached to an open portion of a plastic bag easily if the slider comes off.

[0011] Another object of the present invention is to provide a closing slider which can start closing a zipper of a plastic bag smoothly as well as which has the above advantage.

[0012] Further, another object of the present invention is to provide an opening/closing slider which can start opening and closing a zipper of a plastic bag smoothly.

Disclosure of the Invention

[0013] In order to attain the objects, a first aspect of the present invention relates to a closing slider for closing a zipper comprising a groove and a protrusion, which are mutually engageable with each other, provided on mutually opposite inner surfaces of flaps formed at an open portion of a plastic bag, and the closing zipper comprises: a couple of side legs to be located outside the flaps respectively; a center leg to be located between the flaps and having a length not to reach the zipper; and slits made in an upper portion of the slider and extending to a side of the slider, so that the flaps can be inserted between the center leg and the respective side legs through the slits.

[0014] The structure of the closing slider according to the first aspect of the present invention permits easy reattachment of the slider to the plastic bag if the slider comes off from the open portion of the plastic bag. More specifically, by inserting the flaps of the plastic bag in the slits of the slider, the flaps are pinched between the center leg and the side legs, and thereafter, by rotating the slider by a little over 90 degrees, the slider can be reattached to the open portion of the plastic bag.

[0015] A second aspect of the present invention relates to a closing slider for closing a zipper comprising a groove and a protrusion, which are mutually engageable with each other, provided on mutually opposite inner surfaces of flaps formed at an open portion of a plastic bag, and the closing zipper comprises: a couple of side legs to be located outside the flaps respectively; and a center leg to be located between the flaps and having a length not to reach the zipper. The slider is characterized in that a side portion of the center leg protrudes from the side legs and is exposed.

[0016] The structure of the closing slider according to the second aspect of the present invention permits easy reattachment of the slider to the plastic bag if the slider comes off from the open portion of the plastic bag. More specifically, by inserting the exposed portion of the center leg of the slider between the flaps of the plastic bag and by rotating the slider by a little over 90 degrees so as to pinch the flaps between the center leg and the side legs, the slider can be reattached to the open portion of the plastic bag.

[0017] According to the second aspect of the present invention, for example, by cutting off side portions of the side legs partly and/or by providing a sideway protrusion for the center leg, it becomes possible to expose a side portion of the center leg.

[0018] A structure wherein a side portion of the center leg is exposed both by cutting off side portions of the side legs partly and by providing a sideway protrusion for the center leg also permits a smooth start of a closing motion of the slider. More specifically, by pinching the exposed portion of the center leg over the flaps by hand,

it is possible to fix the side end of the open portion of the bag where a closing motion starts, and thereby, a smooth start of the closing motion is possible.

[0019] A third aspect of the present invention relates to an opening/closing slider for opening and closing a zipper comprising a groove and a protrusion, which are mutually engageable with each other, provided on mutually opposite inner surfaces of flaps formed at an open portion of a plastic bag, and the opening/closing zipper comprises a couple of side legs to be located outside the flaps respectively; and a center leg to be located between the flaps and having a length to extend to an internal of the plastic bag over the zipper. The slider according to the third aspect of the present invention is characterized in that side portions of the side legs are partly cut off, and the center leg has a sideway protrusion, so that a side portion of the center leg protrudes from the side legs and is exposed.

[0020] According to the third aspect of the present invention, the side legs are cut off partly, and the center leg has a sideway protrusion, so that a side portion of the center leg protrudes from the side legs and is exposed. At a start of an opening or a closing motion, a person pinches the exposed portion of the center leg over the flaps by hand so as to fix the side end of the open portion where the opening or closing motion starts. Thereby, it is possible to start the opening or closing motion of the slider smoothly.

Brief Description of the Drawings

[0021] These and other objects and features of the present invention will be apparent from the following description with reference to the accompanying drawings, in which:

Figs. 1a, 1b, 1c, 1d and 1e show a closing slider according to a first embodiment of the present invention, Fig. 1a being a front view, Fig. 1b being a top view, Fig. 1c being a bottom view, Fig. 1d being a left side view and Fig. 1e being a right side view;

Figs. 2a, 2b, 2c and 2d show an important part of the closing slider shown in Figs. 1a through 1e, Fig. 2a being a sectional view taken along the line A-A shown in Fig. 1d, Fig. 2b being a sectional view taken along the line B-B shown in Fig. 1d, Fig. 2c being a sectional view taken along the line C-C shown in Fig. 1d and Fig. 2d being a sectional view taken along the line D-D shown in Fig. 1e;

Figs. 3a, 3b and 3c are illustrations showing reattachment of the closing slider to an open portion of a plastic bag;

Figs. 4a, 4b, 4c, 4d and 4e show a closing slider according to a second embodiment of the present invention, Fig. 4a being a front view, Fig. 4b being a top view, Fig. 4c being a bottom view, Fig. 4d being a left side view and Fig. 4e being a right side view;

Figs. 5a and 5b show a closing slider according to a third embodiment of the present invention, 5a being a front view and 5b being a perspective view;

Figs. 6a, 6b and 6c show a closing slider according to a fourth embodiment of the present invention, 6a being a front view, 6b being a side view and 6c being a perspective view;

Figs. 7a and 7b show a closing slider according to a fifth

embodiment of the present invention, 7a being a front view and 7b being a side view;

Fig. 8 is an illustration showing a start of a closing motion of the slider shown in Fig. 7;

Figs. 9a, 9b, 9c and 9d show an opening/closing slider according to a sixth embodiment of the present invention, 9a being a front view, 9b being a left side view, 9c being a right side view and 9d being a sectional view taken along the line E-E shown in Fig. 9c;

Figs. 10a and 10b show an exemplary plastic bag, Fig. 10a being a perspective view and Fig. 10b being a sectional view of an open portion;

Figs 11a, 11b and 11c show a conventional closing slider, Fig. 11a being a front view, Fig. 11b being a side view and Fig. 11c being a sectional view taken along the line F-F shown in Fig. 11b; and

Figs. 12a, 12b, 12c and 12d show a conventional opening/closing slider Fig. 12a being a front view, Fig. 12b being a left side view, Fig. 12c being a right side view and Fig. 12d being a sectional view taken along the line G-G shown in Fig. 12c.

Best Mode for Carrying out the Invention

[0022] Preferred embodiments of a closing slider and an opening/closing slider according to the present invention are hereinafter described with reference to the accompanying drawings.

First Embodiment; See Figs. 1a through 3c

[0023] Figs. 1a through 1e and Figs 2a through 2d show a closing slider 30A according to a first embodiment of the present invention.

The slider 30A is basically of the structure of the conventional closing slider 10 shown by Figs. 11a through 11c. The slider 30A is to close the zipper 8 provided at the open portion 2 of the plastic bag 1 shown by Fig. 10a and 10b. Further, the slider 30A can be reattached to the open portion 2 easily if the slider 30A comes off.

[0024] The slider 30A has a couple of side legs 31 which are located outside the flaps 3 of the plastic bag 1, and a center leg 35 which is located between the flaps 3 and which has a length not reaching the zipper 8. While the slider 30A is sliding in one direction, mounts 32 formed on the respective inner walls of the side legs 11 push the groove 8a and the protrusion 8b of the zipper 8, and thereby, the groove 8a and the protrusion 8b come into engagement with each other. The center leg 35 serves as a stopper so that the slider 30A itself will not come off from the zipper 8 when the slider 30A reaches a side end 2a of the open portion 2. Also, the side legs 31 have bulges 33 bulging inward so that the slider 30A will not come off upward. Further, the slider 30A has bulges 34 bulging inward so that the slider 30A will not move down unnecessarily.

[0025] The side legs 31 have triangular cut-offs 31a at one corner of the base, and one corner of the base of the center leg 35 is exposed through the cut-offs 31a. The reference number 35a denotes the exposed portion of the center leg 35.

[0026] If the slider 30A receives a strong force from outside and comes off from the open portion 2 of the bag 1, the exposed portion 35a of the center leg 35 permits easy reattachment of the slider 30A to the open portion 2 of the plastic bag 1. Figs. 3a, 3b and 3c show

the reattachment of the slider 30A. First, as shown by Fig. 3a, the slider 30A is put onto the open portion 2 of the bag 1 aslant, and the exposed portion 35a of the center leg 35 is inserted between the flaps 3. Next, as shown by Fig. 3b, the slider 30A is rotated into horizontal. Thereby, the side legs 31 come over the flaps 3, and the center leg 35 is entirely inserted between the flaps 3. Then, as shown by Fig. 3c, the slider 30A is rotated further until the slider 30A becomes upright. In this way, the slider 30A can be fitted in the open portion 2 of the bag 1 at a touch.

[0027] In order to facilitate the reattachment more, as shown by Fig. 2d, the ends 33a and 34a of the bulges 33 and 34 are partly cut off.

[0028] The shadowed portion in Figs. 3a, 3b and 3c is a fused side of the bag 1. In Fig. 8, the shadowed portion is a fused side of the bag 1.

[0029] According to the first embodiment, the cut-offs 31a made in the side legs 31 are not necessarily triangular and may be of the shape as shown by the alternate long and short dash line in Fig. 1a. A slider with cut-offs of this shape is an intermediate between the first embodiment and a second embodiment described below.

Second Embodiment; See Figs. 4a through 4e

[0030] Figs. 4a through 4e show a closing slider 30B according to a second embodiment of the present invention. The slider 30B is basically of the same structure as the slider 30A according to the first embodiment. In Figs. 4a through 4e, the same parts are provided with the same reference numbers as shown in Figs. 1a

through 1e, and descriptions of these parts are omitted.

[0031] The difference between the slider 30B and the slider 30A is that the slider 30B has a couple of slits 36 on the top, and the slits 36 extend to a side of the slider 30B. The slits 36 permit the flaps 3 to be pinched between the center leg 35 and the side legs 31.

[0032] If the slider 30B comes off from the open portion 2 of the plastic bag 1, the slider 30B can be reattached basically in the same way as illustrated in Figs. 3a, 3b and 3c. More specifically, the slider 30B is put onto the open portion 2 of the bag 1 aslant in such a way that the flaps 3 are inserted into the slits 36, and thereby, the flaps 3 are pinched between the center leg 35 and the respective side legs 31 with the center leg 35 located between the flaps 3. Thereafter, the slider 30B is rotated by a little over 90 degrees. In this way, the slider 30B can be reattached to the open portion 2 of the bag 1 easily.

Third Embodiment; See Figs. 5a and 5b

[0033] Figs. 5a and 5b show a closing slider 30C according to a third embodiment of the present invention. The slider 30C is basically of the same structure as the slider 30A according to the first embodiment. In Figs. 5a and 5b, the same parts are provided with the same reference numbers as shown in Figs. 1a through 1e, and descriptions of these parts are omitted.

[0034] The difference between the slider 30C and the slider 30A is that the center leg 35 of the slider 30C has a protrusion 35b protruding sideways from the side legs 31. This protrusion 35b has the same function as the exposed portion 35a of the slider 30A and

facilitates reattachment of the slider 30C to the open portion 2 of the bag 1.

Fourth Embodiment; See Figs. 6a, 6b and 6c

[0035] Figs. 6a, 6b and 6c show a closing slider 30D according to a fourth embodiment of the present invention. The slider 30D is basically of the same structure as the slider 30A according to the first embodiment. In Figs. 6a, 6b and 6c, the same parts are provided with the same reference numbers as shown in Figs. 1a through 1e, and descriptions of these parts are omitted.

[0036] The difference between the slider 30D and the slider 30A is that the side legs 31 of the slider 30D have relatively large cut-offs 31c at both sides, so that both sides of the center leg 35 are exposed. The reference number 35c denotes the exposed portions of the center leg 35. When the slider 30D is to be reattached to the open portion 2 of the bag 1, the exposed portion 35c is inserted between the flaps 3 substantially perpendicularly from above.

Fifth Embodiment; See Figs. 7a, 7b and 8

[0037] Figs. 7a and 7b show a closing slider 30E according to a fifth embodiment of the present invention. The slider 30E is basically of the same structure as the slider 30A according to the first embodiment. In Figs. 7a and 7b, the same parts are provided with the same reference numbers as shown in Figs. 1a through 1e, and descriptions of these parts are omitted.

[0038] The difference between the slider 30E and the slider 30A is that the side legs 31 of the slider 30E have cut-offs 31d at both sides and that the center leg 35 of the slider 30E has sideway

protrusions 35d at both sides, so that both side portions 35d of the center leg 35 are exposed. Each of the exposed portions 35d of the center leg 35 has an area larger than those of the sliders 30A, 30C and 30D.

[0039] The exposed portions 35d have the same function as the exposed portion 35a of the slider 30A and facilitates reattachment of the slider 30E to the open portion 2 of the bag 1. Additionally, the exposed portion 35d permits a smooth start of a closing motion. As shown in Fig. 8, when a person starts moving the slider 30E from a side end 2a of the open portion 2 to close the zipper 8, the person picks the exposed portion 35d located closer to the end 2a over the flaps 3 by one hand and pulls the slider 30E by the other hand in a direction shown by arrow "a". Thus, the closing motion can be started smoothly.

[0040] As mentioned, if the bag 1 is made by melting, the margin at the side end 2a of the open portion 2 is not large enough to be picked by hand. However, by using the slider 30E, a sufficiently large margin is formed by the exposed portion 35d with a relatively large area.

Sixth Embodiment; See Figs. 9a through 9d

[0041] Figs. 9a through 9d show an opening/closing slider 40 according to a sixth embodiment of the present invention. The slider 40 is basically of the same structure as the opening/closing slider 20 shown by Figs. 12a through 12d. The slider 40 opens and closes the zipper 8 provided at the open portion 2 of the plastic film 1 shown by Figs. 10a and 10b, and the slider 40 is an improved slider

which further has a device for permitting a smooth start of an opening/closing motion.

[0042] Specifically, the slider 40 has a couple of side legs 41 located outside the flaps 3, and a center leg 45 located between the flaps 3 and extending to the inside of the bag 1 over the zipper 8. The center leg 45 has recesses 46, in which the groove 8a and the protrusion 8b are positioned, and bulges 47 and 48 above and under the recesses 46. The center leg 45 has a cut-off 49 next to the recesses 46. The side legs 41 have bulges 42 bulging inward opposite the cut-off 49 of the center leg 45.

[0043] When the opening/closing slider 40 is moved in a closing direction, the bulges 42 push the groove 8a and the protrusion 8b of the zipper 8 into the cut-off 49, and the groove 8a and the protrusion 8b come into engagement with each other. Thus, the zipper 8 is closed. On the other hand, when the opening/closing slider 40 is moved in an opening direction, the center leg 45 separates the groove 8a and the protrusion 8b from each other. Thus, the zipper 8 is opened.

[0044] The side legs 41 of the slider 40 have cut-offs 41a at both sides, and the center leg 45 has sideway protrusions 45a at both sides. These protrusions 45a have the same function as the exposed portions 35d of the slider 30E. When a person starts moving the slider 40 to open or close the zipper 8, the person picks either one of the exposed portions 45a over the flaps 3, and thereby, the motion of the slider 40 can be started smoothly.

Other Embodiments

[0045] Although the present invention has been described in connection with the preferred embodiments above, it is to be noted that various changes and modifications are possible to those who are skilled in the art. Such changes and modifications are to be understood as being within the scope of the present invention.

[0046] The plastic bag with a zipper may be made by fusing a zipper with resin films and by fusing the resin films, and may be made by fusing resin films integrally provided with a zipper. The zipper may be a double zipper comprising two lines of grooves and protrusions.